

What is claimed is:

- 1 1. A seating control system to selectively position and monitor the configuration
2 of the seat and back rest of a powered wheelchair including a seat and a back
3 rest adjustably supported on a carriage having a drive mechanism to power
4 the powered wheelchair, said seating control system comprises a seat
5 positioning mechanism and a back rest positioning mechanism to selectively
6 position the seat and the back rest relative to the carriage and a system
7 control including an input control and a microprocessor to control, monitor
8 and record the position of the seat and the back rest relative to the carriage
9 and to selectively retrieve the recorded seat configuration.
- 1 2. The seat control system of Claim 1 wherein said system control includes a
2 means to determine the position of the seat and to generate a seat position
3 signal indicative of the position of the seat relative to the carriage and a
4 means to determine the position of the back rest and to generate a back rest
5 position signal indicative of the position of the back rest relative to the
6 carriage.
- 1 3. The seat control system of Claim 2 wherein said seat position mechanism
2 comprises an inflatable seat support and said back rest position mechanism
3 comprises an inflatable back support coupled to an air pressure source to
4 selectively inflate said inflatable seat support and said inflatable back support.
- 1 4. The seat control system of Claim 3 wherein said means to determine the
2 position of the seat is a pressure sensor operatively disposed relative to said

3 inflatable seat support and said means to determine the position of the back
4 rest is a pressure sensor operatively disposed relative to said inflatable back
5 support to sense the pressure within said inflatable seat and said inflatable
6 back support to generate corresponding signals in response to the pressures
7 therein indicative of the position of said inflatable seat support and said
8 inflatable back support respectively.

1 5. The seat control system of Claim 4 further including an air vacuum operatively
2 coupled to said inflatable seat support and said inflatable back support to
3 selectively deflate said inflatable seat support and said inflatable back
4 support.

1 6. The seat control system of Claim 5 wherein said system control further
2 includes an air supply flow control valve to selectively feed air to said
3 inflatable seat support and said inflatable back support, a discharge flow
4 control to selectively discharge air from said inflatable seat support and said
5 inflatable back support valve in response to said pressure sensors connected
6 to said microprocessor.

1 7. The seat control system of Claim 3 wherein the seat configuration is recorded
2 with respect to time.

1 8. The seat control system of Claim 7 wherein the seat configuration is recorded
2 with respect to duration.

- 1 9. The seat control system of Claim 8 wherein the seat configuration is
2 compared to a prescribed activity regiment and said system control generates
3 an indication when the seat activity varies from said prescribed activity
4 regiment.
- 1 10. The seat control system of Claim 9 wherein said system control monitors and
2 records the seat configuration when the powered wheelchair is occupied.
- 1 11. The seat control system of Claim 2 wherein the position of the seat and back
2 rest are recorded independently with respect to time.
- 1 12. The seat control system of Claim 11 wherein the position of the seat and back
2 rest are recorded independently with respect to duration.
- 1 13. The seat control system of Claim 2 wherein said system control includes
2 means to activate said seat and back rest positioning mechanisms in a
3 predetermined pattern to the reposition of the occupant's body and limbs with
4 respect to time.
- 1 14. The seat control system of Claim 1 wherein said system control includes
2 means to determine the position of said seat positioning mechanism relative
3 to the carriage and to generate a seat position signal in response thereto and
4 means to determine the position of said back rest positioning mechanism
5 relative to the carriage and to generate a back rest position signal in response
6 thereto.

1 15. The seat control system of Claim 14 wherein said seat positioning mechanism
2 comprises a seat tilt positioning assembly including a linear actuator and
3 wherein said back rest positioning mechanism comprises a back rest recline
4 positioning assembly including a linear actuator to tilt the seat and recline of
5 the back rest respectively to change the seat configuration.

1 16. The seat control system of Claim 15 wherein said means to determine the
2 position of the seat is a pressure sensor operatively disposed relative to the
3 seat and said means to determine the position of the back rest is a pressure
4 sensor operatively disposed relative to the back rest to sense the pressure on
5 the seat and the back rest to generate a signals in response to the pressures
6 therein indicative of the position of the seat and back rest respectively.

1 17. The seat control system of Claim 15 wherein said microprocessor receives an
2 input control signal to control the direction of travel of the seat positioning
3 mechanism and calculates the distance of travel of the seat positioning
4 mechanism to determine the new seat position and wherein said
5 microprocessor receives an input control signal to control the direction of
6 travel of the back rest positioning mechanism and calculates the distance of
7 travel of the back rest positioning mechanism to determine the new back rest
8 position.

1 18. The seat control system of Claim 15 wherein said means to determine the
2 position of the seat is a pressure sensor operatively disposed relative to the
3 seat and said means to determine the position f the back rest is a pressure

4 sensor operatively disposed relative to the back rest to sense the pressure
5 within the seat and the back rest to generate corresponding signals in
6 response to the pressures therein indicative of the position of the seat and
7 back rest respectively.

1 19. The seat control system of Claim 14 wherein the seat configuration is
2 recorded with respect to time.

1 20. The seat control system of Claim 19 wherein the seat configuration is
2 recorded with respect to duration.

1 21. The seat control system of Claim 20 wherein the seat configuration is
2 compared to a prescribed activity regiment and said system control generates
3 an indication when the seat activity varies from said prescribed activity
4 regiment.

1 22. The seat control system of Claim 21 wherein said system control monitors and
2 records the seat configuration when the powered wheelchair is occupied.

1 23. The seat control system of Claim 14 wherein the position of the seat and back
2 rest are recorded independently with respect to time.

1 24. The seat control system of Claim 23 wherein the position of the seat and back
2 rest are recorded independently with respect to duration.

1 25. The seat control system of Claim 14 wherein said system control includes
2 means to activate said seat and back rest positioning mechanisms in a

3 predetermined pattern to the reposition of the occupant's body and limbs with
4 respect to time.

1 26. The seat control system of Claim 14 wherein said system control includes a
2 sensor to sense the position of the back rest relative to the carriage and to
3 generate a control signal to disable the drive mechanism when the angle of
4 recline between the back rest and the carriage exceeds a predetermined
5 angle.

1 27. The seat control system of Claim 26 wherein said system control includes a
2 sensor to sense the position of the back rest relative to the carriage to control
3 the limit of travel for said back rest positioning mechanism relative to the
4 carriage.

1 28. The seat control system of Claim 14 further including a leg rest positioning
2 mechanism comprising a left and right leg rest positioning assembly to
3 position a pair of leg rest supports.

1 29. The seat control system of Claim 28 wherein said input control selectively
2 generates a coordinated back rest and leg rest support positioning signal fed
3 to said microprocessor to control said left and right leg rest positioning
4 assemblies and said recline positioning mechanism to extend the leg rest
5 supports as the back rest reclines and to retract the leg rest supports as the
6 back rest inclines.

- 1 30. The seat control system of Claim 29 wherein the speed of operation of said
2 leg rest positioning mechanism is independent of the speed of operation of
3 said recline positioning mechanism such that said leg rest positioning
4 assemblies extend and retract in a coordinated movement with the back rest.
- 1 31. The seat control system of Claim 29 wherein movement of the leg rest
2 supports are synchronized to maintain the right and left legs at the same
3 height.
- 1 32. The seat control system of Claim 3 wherein the position of the seat and back
2 rest are recorded independently with respect to time.
- 1 33. The seat control system of Claim 32 wherein the position of the seat and back
2 rest are recorded independently with respect to duration.